DOCUMENT RESUME

ED 029 060 40 UD 007 318

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A Comparison of Adolescent Intelligence as Measured by the WAIS and the WISC.

Georgia Dept. of Public Health, Milledgeville.
Spons Agency-Office of Education (DHEW), Washington, D.C. Bureau of Research.
Bureau No-BR-6-8773
Pub Date Oct 68
Grant-OEG-2-7-068773-0425
Note-14p.
EDRS Price MF-$0.25 HC-$0.80
Descriptors-Analysis of Variance, *High School Students, *Intelligence Level, *Intelligence Tests, Performance Tests, *Testing, *Test Reliability, Test Results, Verbal Tests
Identifiers-WAIS, Wechsler Adult Intelligence Scale, Wechsler Intelligence Scale for Children, WISC

This study was designed to compare the Wechsler Intelligence Scale for Children (WISC) and Wechsler Adult Intelligence Scale (WAIS) IQ scores (Full Scale, Verbal, and Performance) of 120 16-year-olds, controlling for both practice or order effects and for intellectual level. Each test was administered to each subject, with an average interest interval of 2 weeks. WISC scores on each subtest were subtracted from their WAIS counterparts and a correction factor of 30 points was added to each difference score. Analyses of variance were carried out for each of the subtest scores and significance was found for order of presentation and intelligence level. It was found that the WAIS produces significantly higher score in the less-than-average intellectual range and that the WISC produces significantly higher scores in the average or more-than-average ranges. The mean differences were approximately two points in the average range and seven points in the other groups. (EF)

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This study was prompted by the repeated observations of Special Education Teachers that the Wechsler Adult Intelligence Scale seemed to produce exaggerated estimates of intellectual potential. These same teachers did not report any comparable exaggerations from predictions made from the Wechsler Intelligence Scale for Children. A literature review revealed only three references dealing with the relationship between the WAIS and the WISC. Green (1965) administered the WISC to 50 pupils just under age 16. Four months later, after his Ss reached the age of 16, the WAIS was administered. The principal finding reported was that the WAIS tended to produce scores that were two to four points higher than the WISC, on the Verbal, Performance and Full Scale IQ's. The mean differences between the Performance and the Full Scale IQ of these two instruments proved to be significant. Correlations between the three IQ scores varied from .86 to .92, and were all highly significant.

Webb (1963) reported testing Negro, educable retardates longitudinally, with approximately two years intervening between test administrations, and found that the WAIS produced uniformly higher estimates of intelligence. Relatively high correlations were found between the two instruments, but the mean difference between the IQ scores tended to be about ten points. These differences were statistically significant. Ross and Morledge (1967) tested

30 Ss with the WISC, and four weeks later during which their sixteenth birthday had occurred, administered the WAIS. No significant differences between the mean IQ's derived from the two tests were noted. However, they reported individual difference scores to range from -11 to +13 points, with a mean difference of 2.4 points (WAIS - WISC). Correlational data indicated that these two scales are highly comparable.

The design of the above three studies was such that order of administration was not controlled. In two of the studies (Green, Ross and Morledge) no attempt was made to parcel out the effects of level of intelligence on the comparability of the two instruments. A number of other studies have dealt with WISC and Wechsler-Belview (W-B) comparisons and with W-B and WAIS comparisons, but their results do not indicate that valid generalizations can be made from the WISC to the WAIS. The overall trend noted in these studies would seem to indicate that the WISC produces higher scores than the W-B, and that the W-B yields higher scores than the WAIS. (Cook and Hirt, 1961; Delattre and Cole, 1952; Duncan and Barrett, 1961; Guertin et. al., 1962; Knopf et. al., 1954; Littell, 196 One possible inference from these trends is that the WISC should result in higher scores when compared with the WAIS; this trend was not noted in the above reported studies.

The present study was designed to compare WISC and WAIS performance, controlling for both practice or order effects, and for intellectual level. The specific hypothesis to be tested, in null terms, is: there will be no significant differences between

IQ scores (Full Scale, Verbal, and Performance) derived from the WAIS and the WISC.

METHOD

Subjects

The Ss employed in this study were 120 high school students from various school systems in Georgia. Age limits were set at 15 years, 10 months to 16 years, 1 month, thus covering a span of time two months either side of their 16th birthday. Prior school testing was utilized to locate approximate IQ levels. An attempt was made to have 25% of the Ss in the below 80 IQ range, (less than average-LTA) 25% in the above 120 range (more than average-MTA), and the remaining 50% between 81 and 119 (within the average-WTA). The LTA group had 26 Ss, the WTA group had 65 Ss and the MTA group had 29 Ss.

Procedure

Testing was carried out by school counselors, approved by the State Department of Education, by school psychologists and by clinical psychologists. These testors were paid $25 per student, which included a WAIS and a WISC administration to the same student.

The WAIS and the WISC were administered to each S, with an average intertest interval of two weeks. The WAIS was administered first to 56 Ss and the WISC first to 64 Ss. Table 1 shows the means, standard deviations and the n for each of the six groups.

TABLE 1

Mean IQ's and Standard Deviations by Groups

(n in parenthesis)

	Less Than Average (IQ < 80)				Within the Average (IQ 81-119)				More Than Average (IQ > 119)				Totals Test Order			
	WAIS		WISC		WAIS		WISC		WAIS		WISC		WAIS		WISC	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
WAIS 1st	71.7	6.8	71.4	10.3(13)	104.2	9.1	110.4	13.9(32)	126.1	5.1	133.4	5.1(11)	100.9	20.7	105.8	24.1(56)
WISC 1st	79.6	9.1	66.4	11.9(13)	105.0	8.6	101.7	9.8(33)	123.8	8.0	130.5	6.8(18)	105.2	17.5	102.6	24.2(64)
Total IQ Level	75.7	8.6	68.8	10.6(26)	104.6	8.7	106.0	12.9(65)	124.7	6.9	131.6	6.3(29)	103.2	18.7	104.1	24.1(120)

Testors were required to write out each S's response, thus permitting a complete scoring check on the Verbal subtests. Numerous errors were located in incorrect scoring, in faulty addition and in incorrect score transformations.

RESULTS

WISC Full Scale, Verbal and Performance IQ scores were subtracted from their WAIS counterparts and a correction factor of 30 points was added to each difference score. This corrected difference score became the basic datum employed in the following analyses.

Analyses of Variance were carried out for each of the three IQ scores and significance was found for order of administration and intelligence level for the three scores. Interaction effects were significant for Full Scale and Performance IQ's. These data are presented in Table 2.

TABLE 2

Analyses of Variance of Difference Scores between WAIS minus WISC (Correction Factor Added)

Source	df	MS	F
Full Scale IQ			
Order of Administration (A)	1	105.5	57.06**
Intelligence level (B)	2	101.4	54.87**
A X B	2	20.0	10.80**
Error	114	1.8	
Verbal IQ			
Order of Administration (A)	1	21.2	7.93**
Intelligence level (B)	2	92.2	34.44**
A X B	2	4.0	1.5
Error	114	2.7	
Performance IQ			
Order of Administration (A)	1	217.2	61.1**
Intelligence level (B)	2	58.3	16.4**
A X B	2	41.6	11.7**
Error	114	3.6	

** $p < .01$

To determine the precise location of the significance, 36 't' tests were computed and the mean differences, without the correction factor, are reported in Table 3. All but five of the 36 't' tests proved significant. It should be noted that no significance was found in the Grand Total, Full Scale IQ difference, nor in the Verbal IQ difference.

TABLE 3

Mean Differences, by Groups, of WAIS minus WISC

(no correction added)

	Less Than Average	Within the Average	More Than Average	Total
Full Scale IQ				
WAIS 1st	.2	-7.6**	-7.9**	-5.1**
WISC 1st	13.3**	3.3**	-6.7**	3.3*
Total	6.8**	-2.1*	-7.3**	-1.4
Verbal IQ				
WAIS 1st	4.9**	-4.0**	-5.7**	-1.6*
WISC 1st	10.6**	1.1	-5.2*	2.2
Total	7.8**	-1.5*	-5.5**	.4
Performance IQ				
WAIS 1st	-6.3**	-10.5**	-8.4**	-8.4**
WISC 1st	12.8**	4.7**	-6.6*	3.6*
Total	3.3**	-2.9*	-7.5**	2.6*

*$p < .05$
**$p < .01$

Correlations were carried out in a similar fashion and significance was found in each group, except for the Performance IQ of the WISC first, Above Average group. These data are reported in Table 4.

TABLE 4

Correlations of WAIS with WISC

	Less than Average	Within the Average	More than Average	Total
Full Scale IQ				
WAIS 1st	.958**	.896**	.646*	.973**
WISC 1st	.910**	.850**	.706**	.962**
Total	.698**	.802**	.700**	.949**
Verbal IQ				
WAIS 1st	.912**	.873**	.738**	.963**
WISC 1st	.853**	.837**	.612**	.958**
Total	.819**	.853**	.660**	.958**
Performance IQ				
WAIS 1st	.959**	.756**	.690*	.924**
WISC 1st	.846**	.863**	.444	.902**
Total	.626**	.649**	.511**	.856**

*Significant at the .05 level

** Significant at the .01 level

DISCUSSION

The present findings clearly indicate that the WAIS produces significantly higher IQ scores in the Less Than Average range and that the WISC produces significantly higher scores in the Average and in the More Than Average ranges. The mean differences were approximately 2 points in the Average range and approximately 7 points in the other groups. The absence of significance noted for the grand total Full Scale IQ's and Verbal IQ's is accounted for by the opposite trends of the Less Than and More Than Average groups. In essence, these groups masked real differences by cancelling out their respective effects. This demonstrates the importance of examining the data by levels of intelligence. Inferences concerning the comparability of various tests may need re-examination if all intelligence levels were grouped together in the reliability sample. Thus, Green's (1965) original data was re-examined in an effort to determine if his pooling of all levels of intelligence may have tended to decrease the differences between the two tests. Those eight Ss in his sample who earned the lowest Full Scale IQ's all scored higher on the WAIS. The average difference was about 11 points. Of those 8 Ss who scored the highest Full Scale IQ's, only three earned higher scores on the WAIS. The average difference was slightly in excess of one point, in favor of the WISC. It should be remembered that the WISC was always administered first in this study, thus obviating practice effects as a possible contributor to higher WISC scores. In his 'average' group, 24 out of the 34 Ss scored higher on the WAIS, 9 scored higher on the WISC, and one S earned the same score on

both tests. The average difference was slightly in excess of two points, in favor of the WAIS. Green's data, realigned in this fashion, resembles that half of the findings reported in this study dealing with the WISC first group.

The precise effects of order of administration are difficult to parcel out because of the score discrepancies between the two instruments and because of the varying amounts of each subtest administered as a function of intelligence level. The LTA group scored higher on the WAIS during both administrations, for all scores except Performance IQ when the WISC was administered second. This would indicate that a substantial amount of positive transfer was evidenced by this group on the second test administration. The WTA group demonstrated some positive transfer of learning, although the results indicate that, for this group, the WISC produces slightly higher scores. No extensive score increase was noted as a function of practice, for the MTA group. The results strongly suggest that the WISC consistently produced higher scores.

Retardation has often been conceptualized as a limitation in generalization ability. The present findings, in which generalization varied indirectly with intelligence level, were not anticipated. Perhaps repeated exposure to the same testor and the similarity of the instruments contributed more to a positive testing relationship for the LTA group. This finding warrants further investigation.

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FOOTNOTES

1. This study was supported by Grant No. OEG 2-7-068773-0425, U. S. Office of Education, Department of Health, Education, and Welfare.

2. The authors wish to express their appreciation to Prof. James Pate, Georgia State College, for his invaluable statistical assistance.